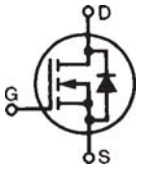
IXYS

Depletion Mode MOSFET

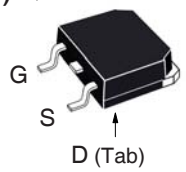
IXTT2N170D2
IXTH2N170D2

V_{DSX} = 1700V
$I_{D(on)}$ ≥ 2A
$R_{DS(on)}$ ≤ 6.5Ω

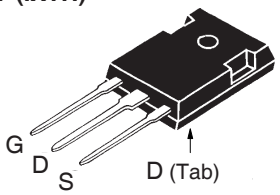
N-Channel



TO-268 (IXTT)



TO-247 (IXTH)



G = Gate D = Drain
S = Source Tab = Drain

Symbol	Test Conditions	Maximum Ratings	
V_{DSX}	T_J = 25°C to 150°C	1700	V
V_{DGX}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	1700	V
V_{GSX}	Continuous	±20	V
V_{GSM}	Transient	±30	V
P_D	T_C = 25°C	568	W
T_J		- 55 ... +150	°C
T_{JM}		150	°C
T_{stg}		- 55 ... +150	°C
T_L	1.6mm (0.062 in.) from Case for 10s	300	°C
T_{SOLD}	Plastic Body for 10s	260	°C
M_d	Mounting Torque (TO-247)	1.13 / 10	Nm/lb.in.
Weight	TO-268	4	g
	TO-247	6	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSX}	V_{GS} = - 5V, I_D = 250μA	1700			V
$V_{GS(off)}$	V_{DS} = 25V, I_D = 250μA	- 2.5		- 4.5	V
I_{GSX}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
$I_{DSX(off)}$	V_{DS} = V_{DSX}, V_{GS} = - 5V			25	μA
	T_J = 125°C			500	μA
$R_{DS(on)}$	V_{GS} = 0V, I_D = 1A, Note 1			6.5	Ω
$I_{D(on)}$	V_{GS} = 0V, V_{DS} = 50V, Note 1	2			A

Features

- Normally ON Mode
- International Standard Packages
- Molding Epoxies Meet UL 94 V-0 Flammability Classification

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- Audio Amplifiers
- Start-Up Circuits
- Protection Circuits
- Ramp Generators
- Current Regulators
- Active Loads

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Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 30V, I_D = 1A, Note 1	1.4	2.2		S
C_{iss}	V_{GS} = -10V, V_{DS} = 25V, f = 1MHz		3650		pF
C_{oss}			206		pF
C_{rss}			80		pF
$t_{d(on)}$	**Resistive Switching Times**		28		ns
t_r	V_{GS} = ±5V, V_{DS} = 850V, I_D = 1A		58		ns
$t_{d(off)}$	R_G = 2Ω (External)		33		ns
t_f			106		ns
$Q_{g(on)}$	V_{GS} = ±5V, V_{DS} = 850V, I_D = 1A		110		nC
Q_{gs}			12		nC
Q_{gd}			60		nC
R_{thJC}				0.22	°C/W
R_{thCS}	TO-247		0.21		°C/W

Safe-Operating-Area Specification

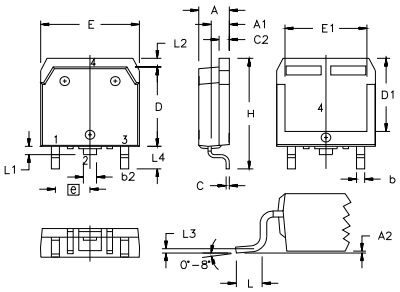
Symbol	Test Conditions	Characteristic Values Min.	Typ.	Max.	
SOA	V_{DS} = 1700V, I_D = 120mA, T_C = 75°C, Tp = 5s	204			W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
V_{SD}	I_F = 2A, V_{GS} = -10V, Note 1		0.75	1.30	V
t_{rr}	I_F = 2A, -di/dt = 100A/µs		2.8		µs
I_{RM}	V_R = 100V, V_{GS} = -10V		45.0		A
Q_{RM}			63.0		µC

Note 1. Pulse test, t ≤ 300µs, duty cycle, d ≤ 2%.

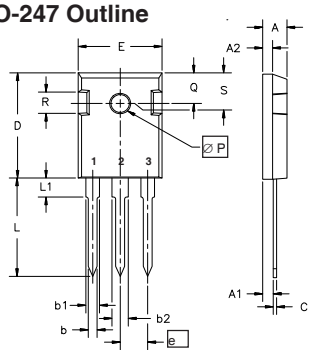
TO-268 Outline



Terminals: 1 - Gate 2,4 - Drain
3 - Source

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
A2	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
b2	.075	.083	1.90	2.10
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.488	.500	12.40	12.70
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
e	.215 BSC		5.45 BSC	
H	.736	.752	18.70	19.10
L	.094	.106	2.40	2.70
L1	.047	.055	1.20	1.40
L2	.039	.045	1.00	1.15
L3	.010 BSC		0.25 BSC	
L4	.150	.161	3.80	4.10

TO-247 Outline



Terminals: 1 - Gate 2 - Drain
3 - Source

Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	4.7	5.3	.185	.209
A_1	2.2	2.54	.087	.102
A_2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b_1	1.65	2.13	.065	.084
b_2	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
ØP	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15 BSC		242 BSC	

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,860,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405 B2 6,710,463 6,727,585 6,759,692 6,771,478 B2 7,005,734 B2 7,063,975 B2 7,071,537 7,157,338B2

Fig. 1. Output Characteristics @ T_J = 25°C

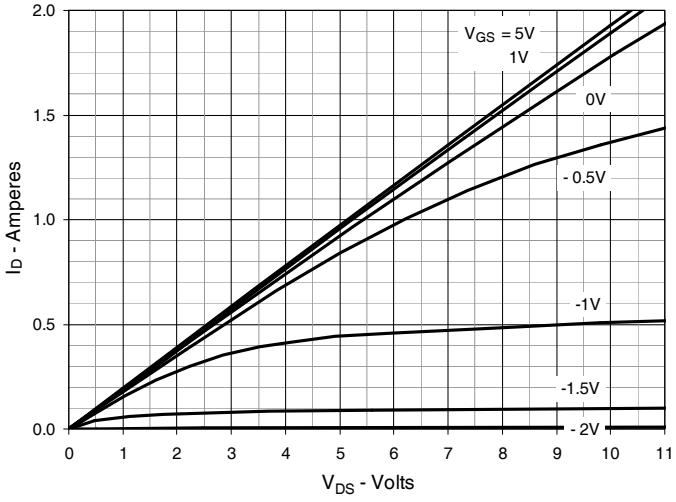


Fig. 2. Extended Output Characteristics @ T_J = 25°C

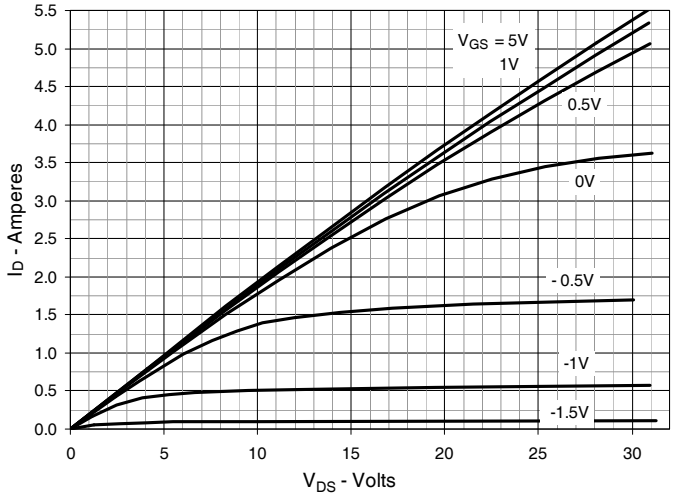


Fig. 3. Output Characteristics @ T_J = 125°C

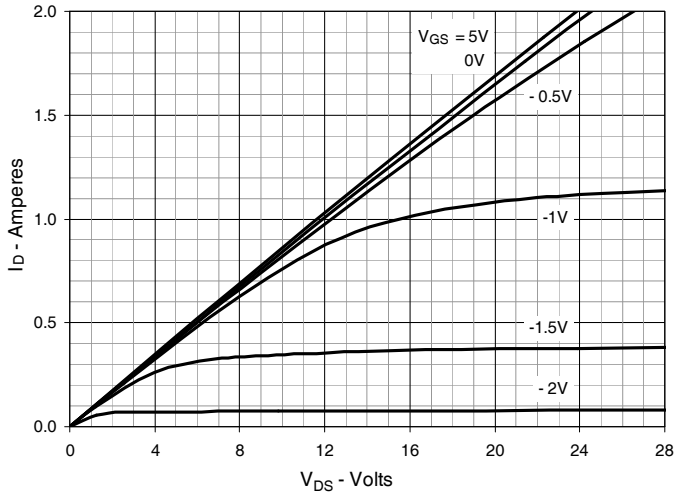


Fig. 4. Drain Current @ T_J = 25°C

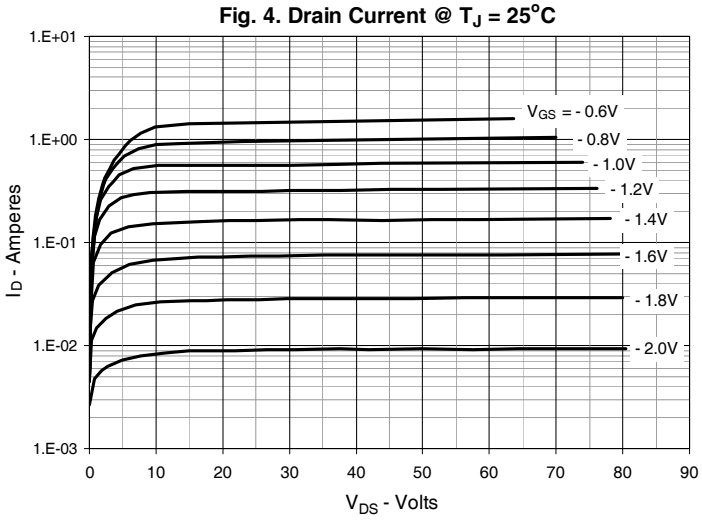


Fig. 5. Drain Current @ T_J = 100°C

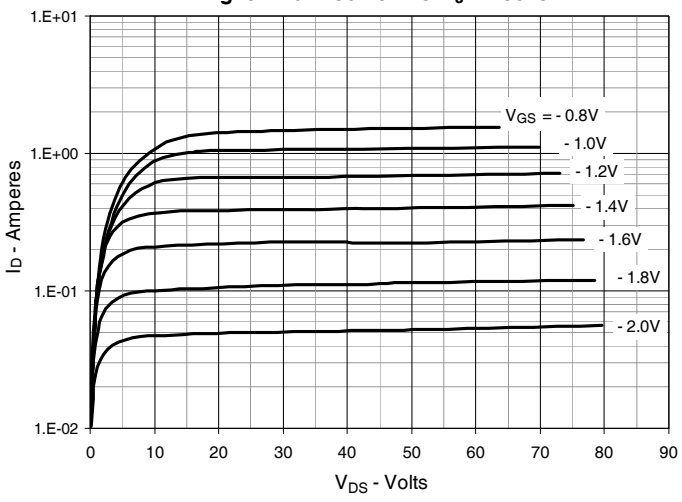
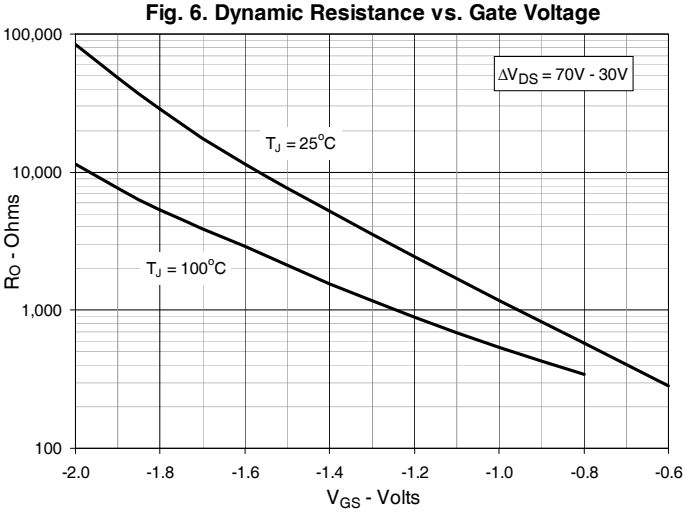


Fig. 6. Dynamic Resistance vs. Gate Voltage



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Fig. 7. Dynamic Resistance vs. Gate Voltage

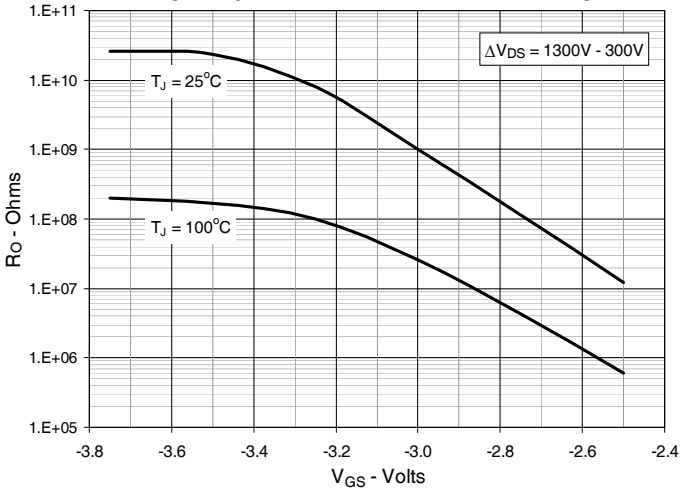


Fig. 8. Normalized $R_{DS(on)}$ vs. Junction Temperature

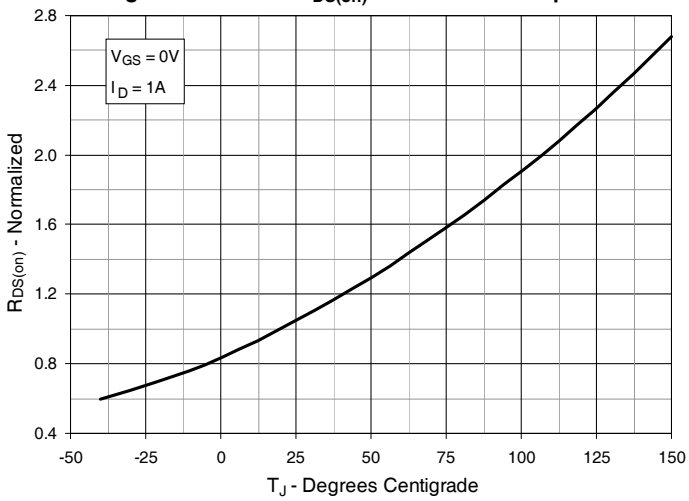


Fig. 9. $R_{DS(on)}$ Normalized to I_D = 1A Value vs. Drain Current

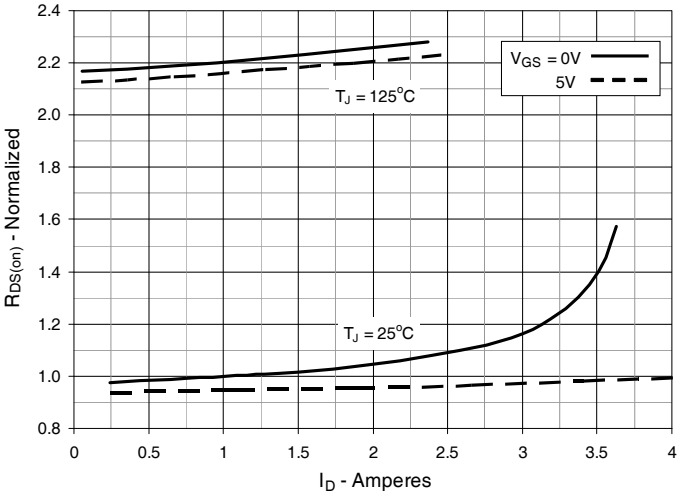


Fig. 10. Input Admittance

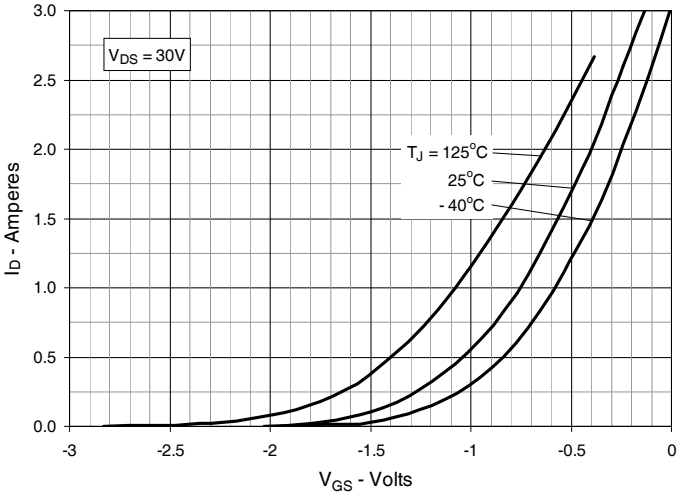


Fig. 11. Transconductance

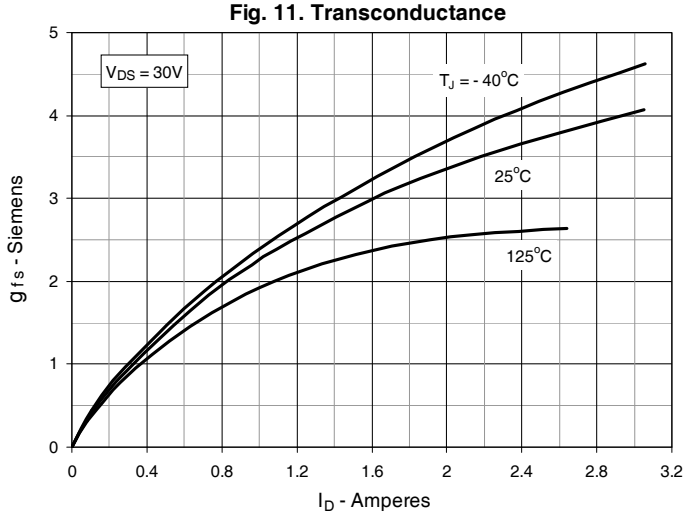
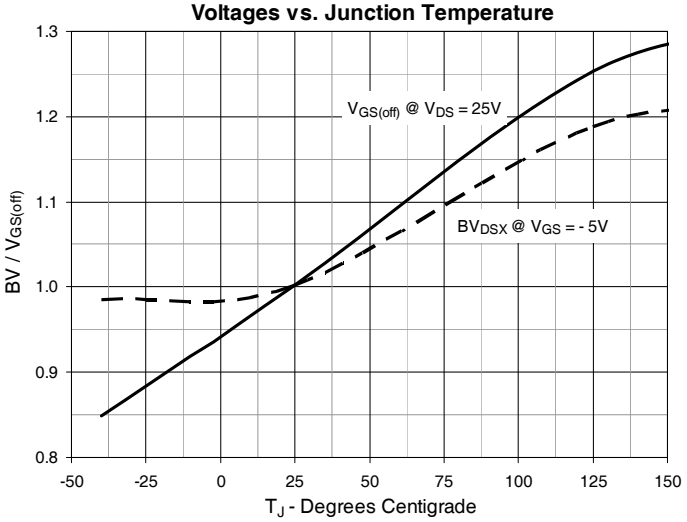


Fig. 12. Normalized Breakdown and Threshold Voltages vs. Junction Temperature



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Fig. 13. Forward Voltage Drop of Intrinsic Diode

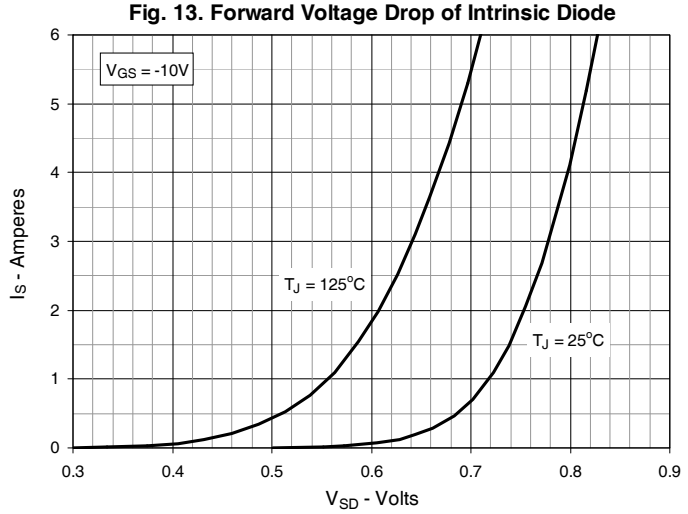


Fig. 14. Capacitance

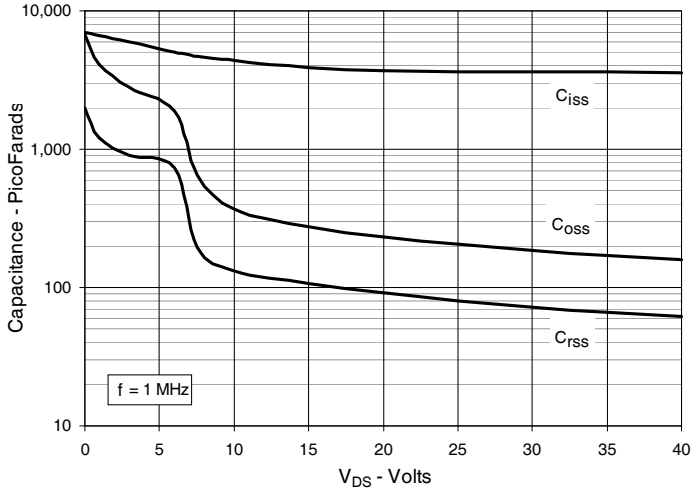


Fig. 15. Gate Charge

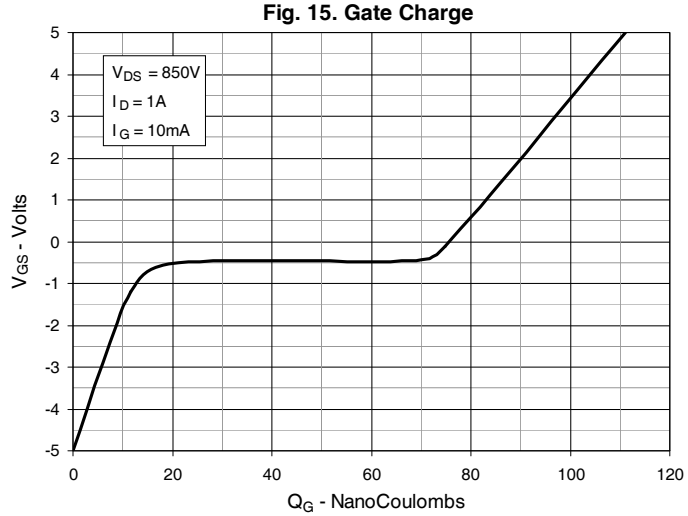


Fig. 16. Maximum Transient Thermal Impedance

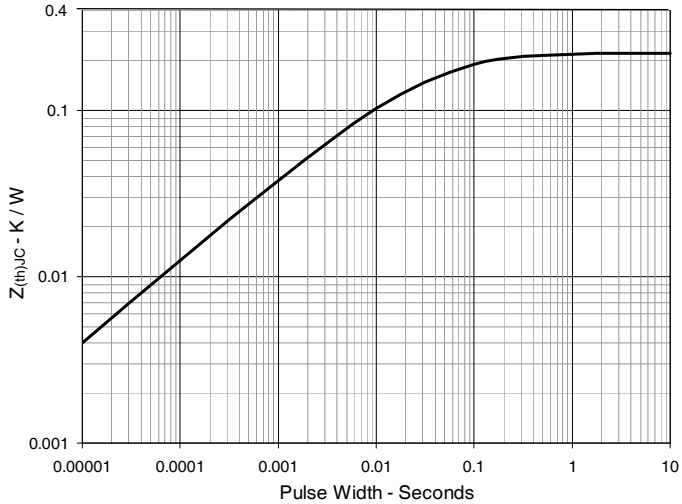


Fig. 17. Forward-Bias Safe Operating Area @ T_C = 25°C

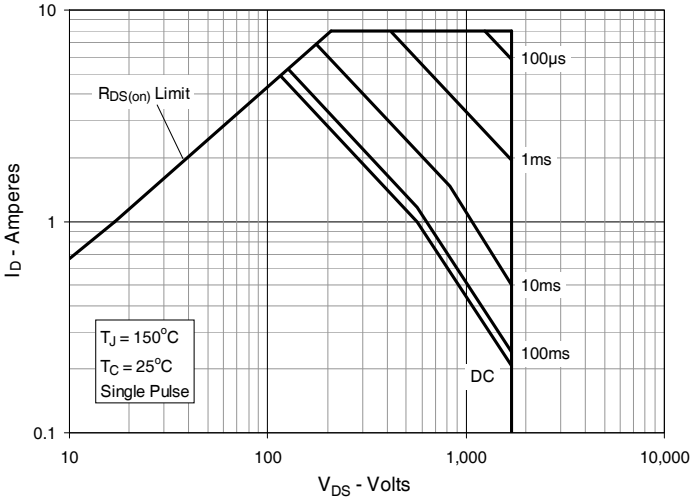
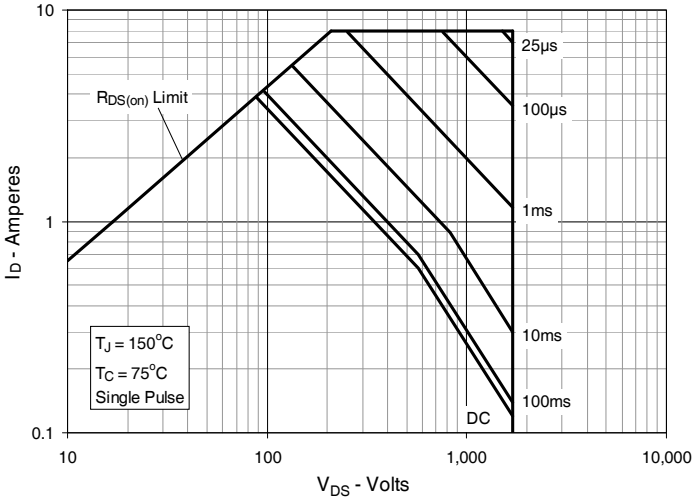


Fig. 18. Forward-Bias Safe Operating Area @ T_C = 75°C



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